

What is claimed is:

1. A scanning optical system for emitting a laser beam scanning in a main scanning direction on a scan target surface; comprising:

a light source that emits the laser beam;

a deflector that dynamically deflects the laser beam emitted by the light source within a predetermined scanning range; and

an imaging optical system that converges the deflected laser beam on the scan target surface to form a beam spot scanning in the main scanning direction,

wherein said imaging optical system comprises:

a first plastic lens having a front surface located on a light source side and a rear surface located on a scan target surface side, said first plastic lens being configured such that origin points of the front and rear surfaces of said first plastic lens are located on opposite sides of a principal axis with regard to an auxiliary scanning direction which is perpendicular to the main scanning direction, an amount of shifting of each of the origin points of said first plastic lens with respect to the principal axis is less than half of a diameter of mirror-finished area of corresponding one of the front and rear surfaces of said first plastic lens, and both of

centers of curvature of the front and rear surfaces of said first plastic lens on the respective origin points are positioned on the light source side of said first plastic lens; and

a second plastic lens having a front surface located on the light source side and a rear surface located on the scan target surface side, at least one of the front and rear surfaces of said second plastic lens having an anamorphic aspherical surface, at least one of origin points of the front and rear surfaces of said second plastic lens being located on the same side of the principal axis as the origin point of the rear surface of said first plastic lens in the auxiliary scanning direction, an amount of shifting of each of the origin points of said second plastic lens with respect to the principal axis being less than half of a diameter of mirror-finished area of corresponding one of the front and rear surfaces of said second plastic lens in the auxiliary scanning direction,

wherein said second plastic lens is located on the scan target surface side with respect to said first plastic lens,

wherein the principal axis corresponds to an extension of a center axis of the laser beam lying between said deflector and said imaging optical system when the center

axis is viewed along a line perpendicular to the auxiliary scanning direction.

2. The scanning optical system according to claim 1;
wherein, with regard to the auxiliary scanning direction, said first plastic lens is configured such that a distance from the origin point of the rear surface to the principal axis is larger than a distance from an intersection of the rear surface and the laser beam passing through said first plastic lens to the principal axis.

3. The scanning optical system according to claim 1,
wherein said second plastic lens satisfies a condition:

$$Ha-1 \text{ [mm]} < Za \text{ [mm]} < Ha+1 \text{ [mm]} \quad \cdots (1)$$

where Za [mm] represents a distance in the auxiliary scanning direction from the principal axis to a center of curvature of one of the front and rear surfaces of said second plastic lens configured to be the anamorphic aspherical surface on its origin point, and Ha represents a distance in the auxiliary scanning direction from the principal axis to a point at which a central axis of the laser beam passing through said second plastic lens intersects with the anamorphic aspherical surface.

4. The scanning optical system according to claim 3,
wherein said imaging optical system satisfies a
condition:

$$u'/u < 1 \qquad \cdots (2)$$

where u represents an angle formed in the auxiliary scanning direction between the principal axis and a central axis of the laser beam being incident on said second plastic lens, u' represents an angle formed in the auxiliary scanning direction between the principal axis and a central axis of the laser beam emerging from said second plastic lens.

5. The scanning optical system according to claim 4,
wherein the amounts of shifting of the origin points of the front and rear surfaces of said second plastic lens with respect to the principal axis are different from each other.

6. The scanning optical system according to claim 5,
wherein said imaging optical system satisfies a
condition:

$$-1.3 < m < -0.6 \qquad \cdots (3)$$

where m represents a lateral magnification of said imaging optical system in the auxiliary scanning direction.

7. The scanning optical system according to claim 1,
wherein said imaging optical system includes at least one glass lens located between said first plastic lens and said second plastic lens,

wherein said imaging optical system satisfies a condition:

$$d1 \leq d0 \times 0.1 \quad \cdots (4)$$

where d0 represents a distance between said first plastic lens and said second plastic lens, and d1 represents a distance between said first plastic lens and said at least one glass lens.

8. The scanning optical system according to claim 7,
wherein said at least one glass lens includes a plurality of glass lenses,

wherein the distance d1 represents a distance between said first plastic lens and one of the plurality of glass lenses located nearest to the scan target surface.